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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,842	02/04/2004	Haruo Tanaka	10233.104USD2	5983

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EXAMINER	
MONDT, JOHANNES P	
ART UNIT	**PAPER NUMBER**
3663	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/772,842	TANAKA ET AL.	
	Examiner	Art Unit	
	Johannes P. Mondt	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-14,16-102,104,105,107,108 and 110-121* is/are pending in the application.

4a) Of the above claim(s) *10-13,17-102,104,105,107,108 and 110-121* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-9, 14 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Amendment filed 4/18/07 forms the basis for this action. In said Amendment applicants substantially amended all elected claims 7-9, 14 and 16 through substantial amendment of independent claim 7 and claims 8 and 9. Comments on Remarks submitted with said Amendment are included below under "Response to Arguments".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. ***Claims 7-9*** are rejected under 35 U.S.C. 102(e) as being anticipated by JP-10241860), of which translation in the form of Patent Family Member Eida et al (USPAT 6,137,459) is available for translation, to which reference is made in this rejection as "Eida et al".

Eida et al teach a surface light-emitting device (see Figures 1 and 5, title, abstract and discussion of Figure 1) including a luminescent layer 34 and an electrode

structure 32/33, the luminescent layer (capable of) emitting light as a result of applying voltage to the electrode structure,

wherein a shielding layer 21 (Figure 5B; and col. 5, l. 2-13) formed in a shape substantially corresponding to a pattern of interference fringes (through the succession of elements 21 in regular fashion in the lateral direction: see Figures 5) of a hologram is provided at a position outside of the luminescent layer (Figure 5A; col. 6, l. 17 –39);

the electrode structure includes a transparent electrode layer 33 (col. 4, l. 59) positioned between the shielding layer 21 and the luminescent layer 34 (Figure 5A),

and the shielding layer, the transparent electrode layer and the luminescent layer abut each other (Figure 5A) and are a unitary structure (Figure 5A), and

wherein the light from the luminescent layer is emitted through the shielding layer (downward, see Figure 1 and discussion; N.B.: the substrate 1 is light-transmissive (col. 4, l. 54).

On claim 8: the electrode structure by Eida et al includes a second electrode layer 32 and the luminescent layer 34 is interposed between the electrode layers 32 and 33 (col. 4, l. 54-62).

On claim 9: a supporting member 1 (col. 4, l. 54 and Figures 5) having transparency is provided at a position outside the shielding layer 21/22.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. ***Claim 7*** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al (USPAT 6,031,856) (previously cited) in view of JP-10241860), for which Family Member Eida et al (USPAT 6,137,459) is available for translation, and to which reference is made in this rejection as "Eida et al".

Wu et al teach a surface-light-emitting device 24 (Figure 2, col. 2, l. 31 – col. 4, l. 25; for 26 see col. 2, l. 55) including a luminescent layer (inherent in VCSEL 26 (col. 2, l. 50 and l. 54) as in any semiconductor laser is a light-emitting layer that emits light when subjected to a voltage, i.e., a luminescent layer, because the driving force of lasing is recombination of electrons and holes accelerated towards each other, the acceleration mechanism being provided by an electric field) and an electrode structure (also inherent in said VCSEL as it is inherent in any semiconductor laser because the electric field is created by means of a voltage difference, and hence two different voltages must needs be provided to the areas abutting the luminescent layer through an

electrode structure, i.e., highly conductive terminal), the luminescent layer emitting light as a result of applying a voltage to the electrode structure (inherent, see above),

wherein a shielding layer 32 (col. 2, l. 49-53, being "partially reflective", hence shielding light) formed in a shape substantially corresponding to a pattern of interference fringes of a hologram, i.e., said shielding layer is the layer in which said hologram is produced, is provided at a position outside of the luminescent layer (32 is outside VCSEL 26 hence *a forteriori* outside said luminescent layer, said luminescent layer being inside said VCSEL 26), and wherein the light from the luminescent layer is emitted through the shielding layer 32 (col. 2, l. 55-58).

Wu et al do not necessarily teach the limitation that the electrode structure to include a transparent electrode between the shielding layer and the luminescent layer such that shielding layer, transparent electrode layer and luminescent layer abut each other and are a unitary structure.

However, it would have been obvious to include said limitation in view of Eida et al, who, in a patent on a surface emitting light-emitting device with patterned shielding layer (title, abstract and "Summary of the Invention"), hence analogous art, teach the electrode on the side of light-emission, i.e., electrode 33 (see Figures 5 and col. 4, l. 54-62 and col. 6, l. 17-38) to be transparent, which is motivated by a reduced loss of yield; while Eida et al teach abutting of the shielding layer 21/22 (col. 4, l. 54-62 and col. 6, l. 17-38) and the luminescent layer and abutting of the transparent electrode and the luminescent layer 34 (loc.cit.), the latter being extremely conventional and

advantageous so as to impart maximum electric field on the luminescent layer, as universally known in the semiconductor diode art.

3. ***Claims 8, 9, 14 and 16*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al and Eida et al as applied to claim 7 above, and further in view of Kozlov et al (6,160,828, in previous action).

As detailed above, claim 7 is unpatentable over Wu et al in view of Eida et al. Neither Wu et al nor Eida et al necessarily teach the further limitations as defined by claims 8, 9, 14 and 16.

With regard to claims 8 and 14, it would have been obvious to include said further limitations as defined in claim 8 in view of Kozlov et al, who, in a patent on a vertical; cavity surface emitting laser (VCSEL) (Figure 5, title, abstract, and cols. 5 and 6), hence analogous art, teach a pair of electrode layers 120 and 121 (col. 5, l. 65 – col. 6, l. 3) interposing the luminescent layer 110 (col. 5, l. 52-61) therebetween, and wherein one of the electrode layers (either one of 120 and 121, say 120) is formed as a transparent electrode layer (loc.cit.), with the light generated by the luminescent layer emitted in a direction substantially perpendicular to the luminescent layer as a laser beam after carrying out lasing through resonance (thus meeting also *claim 14* as a result). Because the shielding layer by Wu et al is provided outside the VCSEL said shielding layer is a forteriori provided outside said one electrode layer also in the combination of the invention by Wu et al and the teaching on Kozlov et al on the electrode structure.

Motivation to include the teaching by Kozlov et al derives from the advantage of achieving maximum surface area of the luminescent layer to be active at minimal voltage difference (because of their short relative distance) between the electrodes. Examiner herewith takes official notice that this motivation is the reason why VCSELs are almost if not always constructed in this manner.

On claim 9: It would furthermore have been obvious to include the limitation as defined by claim 9 also in view of Kozlov et al, who teach a supporting member 113 having transparency (col. 5, l. 48-52) provided to a position inside the VCSEL; in the combined invention this position is outside of the shielding layer 32 (namely: outside the VCSEL 26), and wherein light from the luminescent layer is emitted through said one electrode layer 120 and the supporting member (see Figure 5; loc.cit; see also col. 4, l. 20-25), and , in the combined invention, through the shielding layer 32. *Motivation* to include the teaching by Kozlov et al in the invention by Wu et al in this regard derives from the advantage of transparency of material when light emission must occur through light transmission through the medium made of said material. In particular, if the supporting member 113 were not transparent light would be absorbed and the light efficiency would be poor if at all finite.

On claim 16: although Wu et al do not necessarily teach the further limitation as defined by claim 16, it would have been obvious to include said further limitation in view of Kozlov et al, who teach to include in the VCSEL 26 a plurality of reflecting mirrors (DBRs 111 and 112; see col. 5, l. 50-61 and col. 4, l. 1-24) each having a reflective plane substantially parallel to the luminescent layer 110 (see Figure 5), wherein the

reflecting layers resonate the light generated by the luminescent layer in a direction substantially perpendicular (namely in the emission direction, which is perpendicular to the plane of 110; see Figure 5) to the luminescent layer.(as each reflect a substantial amount of light a substantial amount of light reflected by one DBR is also reflected by the other DBR and hence "resonate" is met and is also a necessary condition for lasing; see, e.g., Fukuda, M., "Optical Semiconductor Devices", pages 165-167) (previously made of record). *Motivation* to include the teaching by Kozlov et al in the invention by Wu et al derives from the resulting controllability of the output spectrum (col. 4, l. 8-10).

Response to Arguments

Applicant's arguments filed 4/18/07 have been fully considered but they are not persuasive. The substantially amended claims have been examined at the earliest possible time. As claimed now, examiner aggress with the shortcoming of Mai et al. However, as evidenced by Eida et al, an electrode structure with transparent electrode, shielding layer and luminescent layer abutting each other and being a unitary structure is in the prior art, as reflected by the rejections overleaf.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JPM
July 7, 2007

Primary Patent Examiner:
Johannes Mondt (TC3600, Art Unit: 3663)